6293

Beam Power Tube

For Pulse-Modulator Service

GENERAL DATA

Electrical:

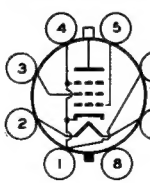
Heater, for Unipotential Cathode:		
Voltage (AC or DC)	6.3 ± 10%	volts
Current at heater volts = 6.3	1.25	amp
Transconductance, for plate volts = 200, grid-No.2 volts = 200, and plate ma. = 100	7000	μmhos
Mu-Factor, Grid No.2 to Grid No.1 for plate volts = 200, grid-No.2 volts = 200, and plate ma. = 100	4.5	
Direct Interelectrode Capacitances:[a]		
Grid No.1 to plate	0.24 max.	pf
Grid No.1 to cathode & grid No.3 & internal shield, grid No.2, base sleeve, and heater	13.0	pf
Plate to cathode & grid No.3 & internal shield, grid No.2, base sleeve, and heater	8.5	pf

Mechanical:

Operating Position	Any
Overall Length	3-13/16" ± 1/8"
Seated Length	3-1/8" ± 1/8"
Maximum Diameter	1-23/32"
Weight (Approx.)	2.3 oz
Bulb	T12
Cap	Small (JEDEC No.C1-1)

Bases (Alternates):
- Large-Wafer Octal with Sleeve:
  8-Pin Micanol (JEDEC Group 1, No.B8-86)
- Large-Wafer Octal with External Barriers and Sleeve:
  8-Pin Micanol (JEDEC Group 1, No.B8-98)
- Basing Designation for BOTTOM VIEW 7CK

Pin 1 – Cathode, Grid No.3, Internal Shield
Pin 2 – Heater
Pin 3 – Grid No.2



Pin 4 – Same as Pin 1
Pin 5 – Grid No.1
Pin 6 – Same as Pin 1
Pin 7 – Heater
Pin 8 – Base Sleeve, Cap – Plate

MODULATOR — Rectangular-Wave Modulation

Maximum and Minimum CCS[b] Ratings, *Absolute-Maximum Values:*

For Duty Factor[c] between 0.001 and 1 and maximum averaging time of 10,000 μsec in any interval

DC PLATE SUPPLY VOLTAGE[d] . . . . . See *Rating Chart I*

← Indicates a change.

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INSTANTANEOUS PLATE VOLTAGE	115% of DC Plate Supply Volts	
DC GRID-No.2 SUPPLY VOLTAGE[d]	500 max.	volts
→ DC GRID-No.1 SUPPLY VOLTAGE[d]	{-300 max. { Minimum-See *Rating Chart I*	volts
GRID-No.1 VOLTAGE:		
Instantaneous-negative value	400 max.	volts
Peak-positive value	100 max.	volts
PEAK PLATE CURRENT	See *Rating Chart II*	
PEAK GRID-No.2 CURRENT	0.75 max.	amp
PEAK GRID-No.1 CURRENT	0.5 max.	amp
PLATE INPUT	80 max.	watts
GRID-No.2 INPUT	1.75 max.	watts
GRID-No.1 INPUT	0.5 max.	watt
PLATE DISSIPATION[e]	See *Rating Chart I*	
PEAK HEATER-CATHODE VOLTAGE:		
Heater negative with respect to cathode	135 max.	volts
Heater positive with respect to cathode	135 max.	volts
BULB TEMPERATURE (At hottest point on bulb surface)	200 max.	°C

Typical Operation:

DC Plate Supply Voltage	3000	volts
DC Grid-No.2 Supply Voltage	300	volts
DC Grid-No.1 Supply Voltage	-175	volts
Peak Positive Grid-No.1 Voltage	65	volts
Plate Current:		
Peak	1.5	amp
Average	0.015	amp
DC Grid-No.2 Current	0.004	amp
DC Grid-No.1 Current	0.0025	amp
Load Resistance (R_L), 100 watts, non-inductive	1500 ± 5%	ohms

Maximum Circuit Values:

Grid-No.1-Circuit Resistance	30000 max.	ohms

[a] Without external shield and base sleeve connected to ground.

[b] Continuous Commercial Service.

[c] *Duty Factor* for the 6293 is defined as the "on" time in microseconds divided by 10,000 microseconds.

"On" Time is defined as the sum of the durations of all the individual pulses which occur during any 10,000-microsecond interval.

"Pulse Duration" is defined as the time interval between the two points on the pulse at which the instantaneous value is 70 per cent of the peak value. The peak value is defined as the maximum value of a smooth curve through the average of the fluctuations over the top portion of the pulse.

[d] For tube protection, it is essential that sufficient resistance be used in the plate supply circuit, the grid-No.2 supply circuit, and the grid-No.1 supply circuit so that the short-circuit current is limited to 0.5 ampere in each circuit.

[e] Averaged over any interval not exceeding 10,000 microseconds. Care should be used in determining the plate dissipation. A calculated value based on rectangular pulses can be considerably in error when the actual pulses have a finite rise and fall time. Plate dissipation should preferably be determined by measuring the bulb temperature under actual operating conditions; then, with the tube in the same socket and under the same ambient-temperature conditions, apply to the tube sufficient dc input to obtain the same bulb temperature. This value of dc input is a measure of the plate dissipation.

→ Indicates a change.

CHARACTERISTICS RANGE VALUES FOR EQUIPMENT DESIGN

	Note	Min.	Max.	
Heater Current.	1	1.175	1.325	amp
Grid No.1 to plate.	2	–	0.24	pf
Grid No.1 to cathode & grid No.3 & internal shield, grid No.2, base sleeve, and heater	2	12.0	15.0	pf
Plate to cathode & grid No.3 & internal shield, grid No.2, base sleeve, and heater	2	7.3	9.5	pf
Plate Current	3	46	94	ma
Grid-No.2 Current	3	0	5.5	ma
Peak Plate Current.	1,4	2.4	–	amp

Note 1: With 6.3 volts ac on heater.

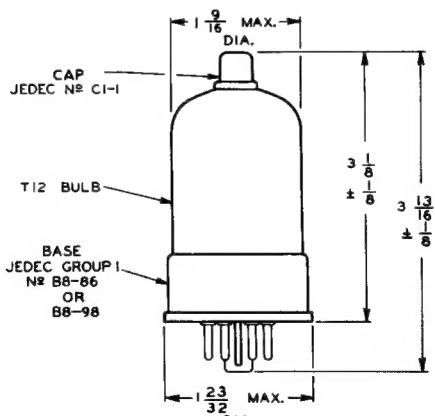
Note 2: With no external shield. Base sleeve (pin No.8) is grounded.

Note 3: With 6.3 volts ac on heater, dc plate voltage of 300 volts, dc grid-No.2 voltage of 200 volts, and dc grid-No.1 voltage of -33 volts.

Note 4: With the tube in the test circuit (below) under the following conditions: rectangular-wave modulation applied to grid No.1 pulse duration of 1 microsecond approx.; pulse repetition rate of 3000 cps approx.; dc plate supply voltage of 2000 volts; dc grid No.2 supply voltage of 500 volts; dc grid-No.1 supply voltage of -300 volts; peak positive grid-No.1 swing of 100 volts; and load resistance (R_L) of 375 ± 5% ohms, 50 watts, non-inductive.

OPERATING CONSIDERATIONS

Plate shows no color when tube is operated at maximum CCS ratings.



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ALL DIMENSIONS IN INCHES.

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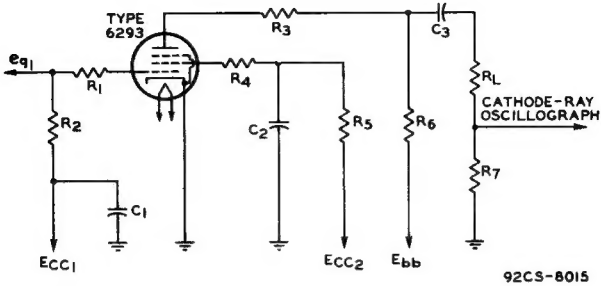
TEST CIRCUIT



C_1: 0.1 μf, 600 v dc
C_2: 2 μf, 600 v dc
C_3: 0.25 μf, 5000 v dc
E_{cc1}: Grid-No.1 Supply Volt.
E_{cc2}: Grid-No.2 Supply Volt.
E_{bb}: Plate Supply Voltage
E_{g1}: Rectangular-Wave Signal Voltage
R_1: 20 ohms, 1 watt, non-inductive
R_2: 3000 ohms, 1 watt
R_3: 10 ohms, 5 watts, non-inductive
R_4: 25 ohms, 1 watt, non-inductive
R_5: 1000 ohms, 1 watt
R_6: 10000 ohms, 50 watts
R_7: 30 ± 1% ohms, non-inductive
R_L: For values, see Typical Operation and Characteristics Range Values (Note 4)

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RADIO CORPORATION OF AMERICA
Electron Tube Division
Harrison, N. J.

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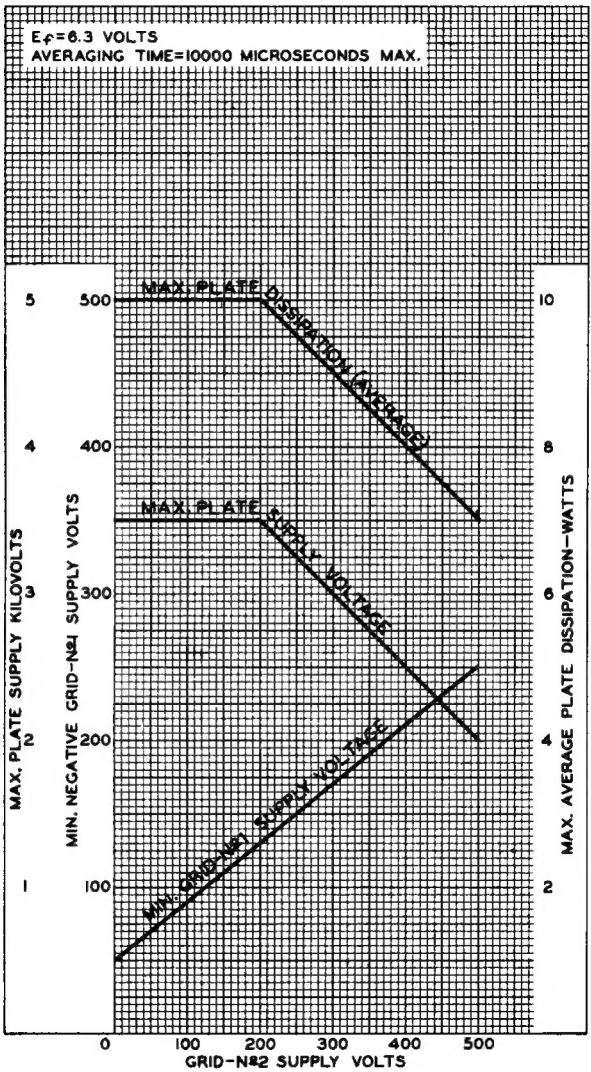
RATING CHART I



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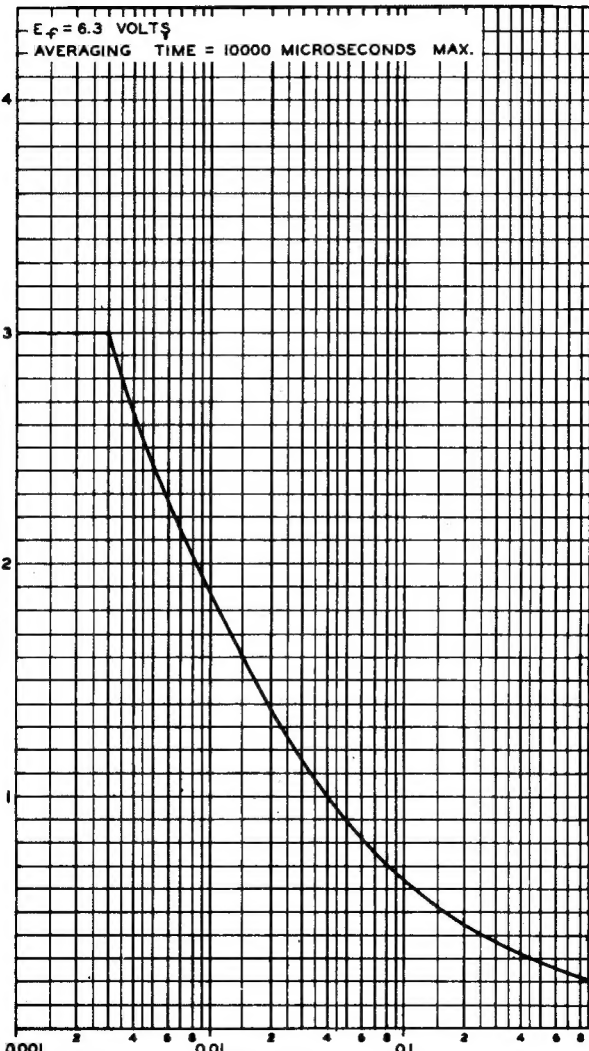
RATING CHART II



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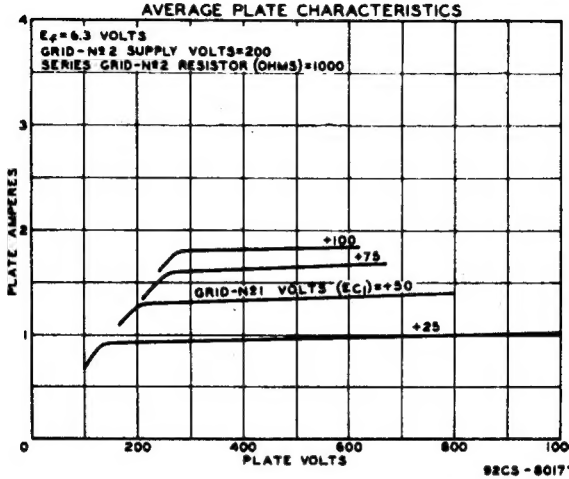
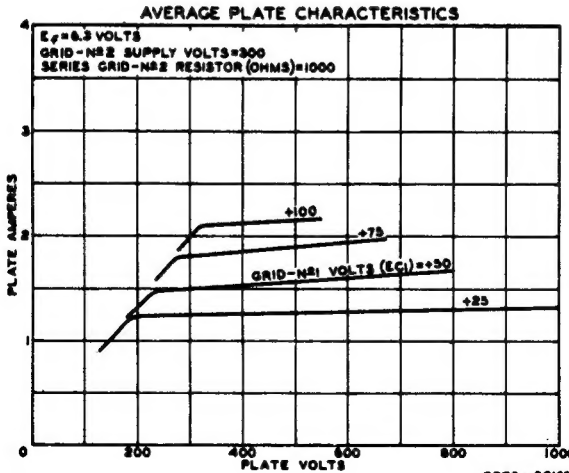
BEAM POWER AMPLIFIER





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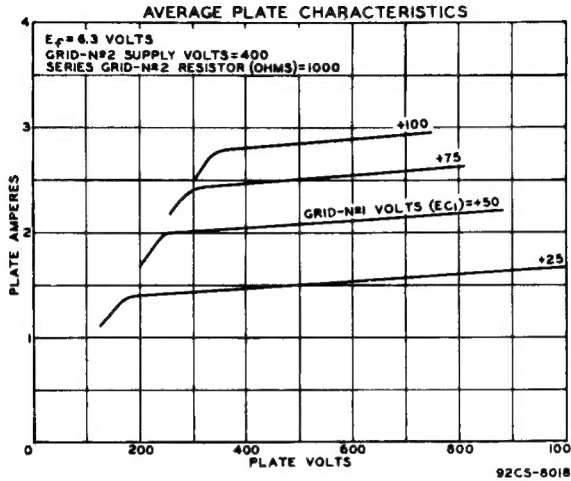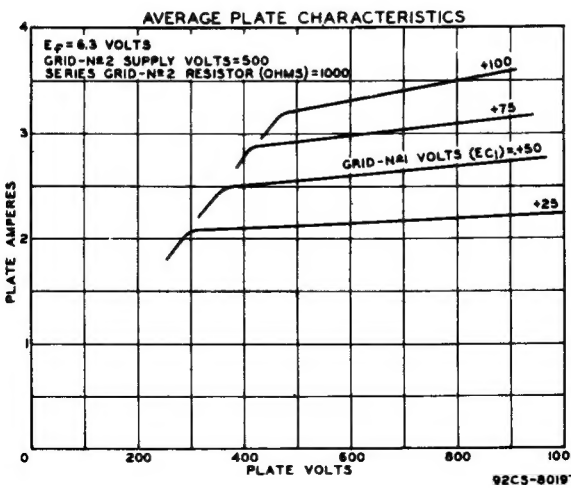
BEAM POWER AMPLIFIER